



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|----------------------------|-------------|----------------------|---------------------|------------------|
| 10/721,866 | 11/26/2003 | Graham Strachan | 3901.US.P | 6091 |
| 56436 | 7590 | 12/11/2007 | EXAMINER | |
| 3COM CORPORATION | | | SONI, KETAN S | |
| 350 CAMPUS DRIVE | | | ART UNIT | |
| MARLBOROUGH, MA 01752-3064 | | | PAPER NUMBER | |
| | | | 2619 | |
| | | | MAIL DATE | |
| | | | DELIVERY MODE | |
| | | | 12/11/2007 | |
| | | | PAPER | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/721,866 | Applicant(s) STRACHAN ET AL. | |
| | Examiner Ketan Soni | Art Unit 2619 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>04/07/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

- Applicant's Amendment filed on 09/17/2007 has been acknowledged.
- Claims 1, 4, and 5 are amended.
- This action is made FINAL.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 - 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ivaturi (US6873603 B1)** in view of **Gallo et al. (US 6907469 B1)**.

Consider **claim: 1** (currently amended), Ivaturi discloses a method of operating a network switch which is an edge switch in an Ethernet communication network having a multiplicity of sub-nets (a switch may operate in Layer 2 or in Layer 3, col: 15, lines: 36), is arranged to receive and forward packets which include media access control, address data and network address data, and is in communication with a core router via an uplink, (DLSw router 2 receives its updates with the MAC address, col: 5, lines: 27-32, and col: 7, lines: 4-9) comprising:

performing a network address look-up in respect of packet, which is received by the edge switch from a source local to the edge switch and on a first sub-net and only if the packet has a media access control destination address of the core router (DLSw router2, receives update with the MAC address of A, col: 5, lines: 27-30; and MAC address of the bridge is read from the SA field of the MAPP request frame, which (MAPP) is received by all end stations connected to the LAN, col: 9, lines: 18-20); forwarding the packet directly towards its destination in response to the network destination address data in the packet, without the packet traversing the core router via the uplink, when the network destination address is a destination local to the edge switch, but on a second sub- net (bridge receives a MAPP request from each station which responds to the broadcast, col:9, lines: 22-35; MAPP table contains entry for each end station which can be reached on LOCAL LANs by the bridge, which is a layer 2 device, col: 10, lines: 32-35); and forwarding the packet from the edge switch to the

core router via the uplink (MAPP broadcasts Destination Address, col: 8, lines: 55). Even though Ivaturi discloses forwarding packet from layer 2 device to core router by broadcasting, is generally silent about forwarding the packet from the edge switch to the core router via the uplink, whenever the network destination address is a destination that is not local to the edge switch; and edge switch maintaining look-up tables of media access control addresses and network addresses only for local sources and destinations on both the first and second sub-nets.

In the same field of endeavor, Gallo et al. discloses forwarding the packet from the edge switch to the core router via the uplink, whenever the network destination address is a destination that is not local to the edge switch (If the frame needs L3 processing it is sent to the logical router 208, column: 3, Lines: 30-31; (The look-up on the (destination address) DA determined where the frame needs L3 processing or not by the logical router 208, column: 3, Lines: 25-27); A status bit the MAC address database in the entry will indicate that if the frame is destined for a particular MAC address, it is L3 traffic, column: 3, Lines: 28-30); and edge switch maintaining look-up tables of media access control addresses and network addresses only for local sources and destinations on both the first and second sub-nets (A network switch connects multiple virtual LANs (VLANs) and process frames for transfer within a VLAN or between VLANs. The L2 protocol is used for frame transfers within a VLAN, column: 1, lines: 35-37).

There for it would have been obvious to a person with ordinary skill in the art at the time the invention was made to incorporate a method of operating a network switch

in the communication control statement for connecting network and other sub network as taught by Furuichi in the method of Gallo et al. for the network switch that is capable to connect multiple virtual LANs (VLANs) and process frames for transfer within a particular VLAN (Layer-2 bridging) or between the VLANs using the MAC database address.

Consider **claim: 2**, and as applied to the method of claim 1, Ivaturi as modified by Gallo discloses the method of claim: 1. Further taught by combination, and specifically by Ivaturi wherein the network switch forwards the packet to the core router in response to media access control data in the packet (MAC address population: protocol constructed with a broadcast destination address, col: 10, lines: 26-27).

Consider **claim: 3**, and as applied to the method of claim 1, Ivaturi as modified by Gallo discloses the method of claim: 1. Further taught by combination and specifically by Gallo wherein the network switch provides a default route to the core router for network destination addresses which are not local to the network switch (If the frame needs L3 processing it is sent to the logical router 208, column: 3, Lines: 30-31; (The look-up on the (destination address) DA determined where the frame needs L3 processing or not by the logical router 208, column: 3, Lines: 25-27); A status bit the MAC address database in the entry will indicate that if the frame is destined for a particular MAC address, it is L3 traffic, column: 3, Lines: 28-30).

Consider **claim: 4**, (currently amended) Ivaturi discloses a network edge switch having ports for the reception and forwarding of Ethernet packets which include media access control address data and network address data (a switch may operate in Layer 2 or in Layer 3, col: 15, lines: 36; and MAC address of the bridge is in the SA field of the MAPP request frame, col: 9, lines: 18-20) and organized:

(a) to perform a media access control address look-up in respect of a first packet received by the edge switch (DLSw router2, receives update with the MAC address of A, col: 5, lines: 27-30; and MAC address of the bridge is read from the SA field of the MAPP request frame, MAPP is received by all end stations connected to the LAN, col: 9, lines: 18-20);

(b) to bridge the packet if a source and a destination of the packet are on a same subnet and local to the edge switch (Bridge connects local end stations, and they are responded by MAPP protocol, col: 10, lines: 32-35). However Ivaturi is generally silent about performing a network destination address look-up in respect of a second, packet which is received by the edge switch t'rom a source local to the edge switch and on. a first sub-net and has a network destination address on a second sub-net, the network destination address look-up performed only if the media access control destination address of the second packet is to a core router connected to the edge switch by an uplink, forwarding said second packet directly towards its destination in response to network address data in said second packet when the destination thereof is a local destination; and forwarding said second packet from the edge switch by a default route, in response to media access control address data in said second packet, if the

destination thereof is not local to the edge switch, said edge switch having look-up tables of media access control addresses and network addresses for local sources and destinations on both the first and second sub-nets.

In the same field of endeavor, Gallo discloses performing a network destination address look-up (Fig: 4, Look up DA in MAC D/B- 401) in respect of a second, packet which is received by the edge switch from a source local to the edge switch and on a first sub-net and has a network destination address on a second sub-net, the network destination address look-up performed only if the media access control destination address (Fig: 4, Look up DA in MAC D/B- 401) of the second packet is to a core router connected to the edge switch by an uplink (Network data frames such as frame 202 enter the switch (frame or packet to be sent on L-2 (1st subnet) or L-3 (2nd subset)) from a physical medium through a plurality of ports 212 in the NPs, column: 3, lines: 8-10; If the frame needs L3 (2nd subset) processing it is sent to the logical router 208, column: 3, Lines: 30-31; (The look-up on the (destination address) DA determined where the frame needs L3 processing or not by the logical router 208, column: 3, Lines: 25-27); A status bit the MAC address database in the entry will indicate that if the frame is destined for a particular MAC address, it is L3 traffic, column: 3, Lines: 28-30); (d) to forward said second packet directly towards its destination in response to network address data in said second packet when the destination thereof is a local destination (L2 processing typically comprises a look-up for the destination address (DA) in the frame in the MAC address database 210, to determine whether to filter, flood, or forward the frame, column: 3, Lines: 11-14); and

(e) to forward said second packet from the edge switch by a default route, in response to media access control address data in said second packet, if the destination thereof is not local to the edge switch, said edge switch having look-up tables of media access control addresses and network addresses for local sources and destinations on both the first and second sub-nets (Network data frames such as frame 202 enter the switch (frame or packet to be sent on L-2 (1st subnet) or L-3 (2nd subnet) from a physical medium through a plurality of ports 212 in the NPs, column: 3, lines: 8-10; The look-up on the DA in the frame will also determine whether the frame needs L3 processing by the logical router (default route) 208, column: 3, lines: 25-26; The logical bridge in the NP performs L2 processing of the frame, including MAC address learning. As shown in blocks 308-311, to do the learning, the SA in the frame is looked up in the local MAC address table. If it is already present, the frame is sent to its destination, the CP. If not, the SA and its port of origin is added to the MAC address database, and the frame is sent to the CP, column: 4, lines: 11-15; If the frame needs L3 processing it is sent to the logical router 208, column: 3, Lines: 30-31; (The look-up on the (destination address) DA determined where the frame needs L3 processing or not by the logical router 208, column: 3, Lines: 25-27); A status bit in the MAC address database in the entry will indicate that if the frame is destined for a particular MAC address, it is L3 traffic, column: 3, Lines: 28-30).

Consider **claim: 5** (currently amended) Ivaturi discloses a combination of a core router and an edge switch (In modern computer systems both a bridge function and a

router function are built within one hardware box, col: 1, lines: 38-39; and Bridges 104, 106, 108 normally bridge packets at the layer 2 level, however the bridge functions may be incorporated as elements of a Router. A Router normally operates at Layer 3 level of communications protocol, however, many modern day Routers include a bridging function, col: 7, lines: 14-19); connected by an uplink, (Bridge 106 is illustrated as connected at its port 112A to a DLSw function internal to the bridge, and externally port 112A connects to link 112 as a TCP/IP connection to IP network cloud 102, col: 7, lines: 19-21) for the reception and forwarding of Ethernet packets, wherein edge switch is organized (a) performing a media access control address look-up in respect of a first packet received by the edge switch (DLSw router2, receives update with the MAC address of A, col: 5, lines: 27-30; and MAC address of the bridge is read from the SA field of the MAPP request frame, MAPP is received by all end stations connected to the LAN, col: 9, lines: 18-20); (b) to bridge said first packet when the media access control source and a destination addresses of the packet are for devices on a same subnet and local to the edge switch (Bridge connects local end stations, and they are responded by MAPP protocol, col: 10, lines: 32-35). However Ivaturi is generally silent about performing a network destination address look-up in respect of a second packet which is received by the edge switch from a source local to the edge switch and on a first subnet and has a destination on a second sub-net wherein the network destination address look-up is performed only if the media access control destination address of the packet is the core router media access control address; forwarding second packet directly towards its destination in response to network address data in said second packet when

the destination thereof is a local destination; and forwarding second packet to core router via the uplink, from the edge switch, in response to media access control address data in said second packet, if the destination thereof is not local to the edge switch, said edge switch having look-up tables of media access control addresses and network addresses only for sources and destinations local to the edge switch on both the first and second sub-nets.

In the same field of endeavor, Gallo discloses performing a network destination address look-up (Fig: 4, Look up DA in MAC D/B- 401) in respect of a second packet which is received by the edge switch from a source local to the edge switch and on a first sub-net and has a destination on a second sub-net wherein the network destination address look-up (Fig: 4, Look up DA in MAC D/B- 401) is performed only if the media access control destination address of the packet is the core router media access control address (Fig: 4, Look up DA in MAC D/B- 401) of the second packet is to a core router connected to the edge switch by an uplink (Network data frames such as frame 202 enter the switch (frame or packet to be sent on L-2 (1st subnet) or L-3 (2nd subset)) from a physical medium through a plurality of ports 212 in the NPs, column: 3, lines: 8-10; If the frame needs L3 (2nd subset) processing it is sent to the logical router 208, column: 3, Lines: 30-31; (The look-up on the (destination address) DA determined where the frame needs L3 processing or not by the logical router 208, column: 3, Lines: 25-27); A status bit the MAC address database in the entry will indicate that if the frame is destined for a particular MAC address, it is L3 traffic, column: 3, Lines: 28-30); (d) to forward said second packet directly towards its destination in response to network

address data in said second packet when the destination thereof is a local destination (L2 processing typically comprises a look-up for the destination address (DA) in the frame in the MAC address database 210, to determine whether to filter, flood, or forward the frame, column: 3, Lines: 11-14); and

(e) to forward said second packet to said core router via the uplink, from the edge switch, in response to media access control address data in said second packet, if the destination thereof is not local to the edge switch, said edge switch having look-up tables of media access control addresses and network addresses only for sources and destinations local to the edge switch on both the first and second sub-nets (Network data frames such as frame 202 enter the switch (frame or packet to be sent on L-2 (1st subnet) or L-3 (2nd subset) from a physical medium through a plurality of ports 212 in the NPs, column: 3, lines: 8-10; The look-up on the DA in the frame will also determine whether the frame needs L3 processing by the logical router (default route) 208, column: 3, lines: 25-26; The logical bridge in the NP performs L2 processing of the frame, including MAC address learning. As shown in blocks 308-311, to do the learning, the SA in the frame is looked up in the local MAC address table. If it is already present, the frame is sent to its destination, the CP. If not, the SA and its port of origin is added to the MAC address database, and the frame is sent to the CP, column: 4, lines: 11-15; If the frame needs L3 processing it is sent to the logical router 208, column: 3, Lines: 30-31; (The look-up on the (destination address) DA determined where the frame needs L3 processing or not by the logical router 208, column: 3, Lines:

25-27); A status bit the MAC address database in the entry will indicate that if the frame is destined for a particular MAC address, it is L3 traffic, column: 3, Lines: 28-30).

Response to Arguments

Applicant's arguments filed on Sep 17, 2007 with respect to claims: 1-5 have been fully considered but they are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

□ Callon et al. (U.S. Patent/ PG PUB # 5251205) discloses: Brouter and Multiple Protocol Routing.

- Kanuri et al. (U.S. Patent/ PG PUB # 7079537) discloses: Layer-3 switching logic architecture in an integrated network switch.
- Yim (U.S. PG PUB # US 2002/0052972 A1) discloses: Communication method for VLAN in internet protocol subnet involves transmitting unicast packet from source host to destination host using MAC address included in response packet received from the destination host.
- Shah (U.S. PG PUB # US 2004/0088389 A1) discloses: Methods and apparatus for automated edge device
- Creedon et al. (U.S. Patent # US 5987507) discloses: Multi-port communication network device with threshold control of port packet counters.
- Wilson et al. (U.S. Patent # US 6470025 B1) discloses: System for providing fair access for VLANs to a shared transmission medium.

Any response to this Office Action should be **faxed to (571) 273-8300 or mailed to:**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ketan Soni whose telephone number is (571) 270-1782. The Examiner can normally be reached on Monday-Thursday from 7:30am to 6:00pm.

Application/Control Number:
10/721,866
Art Unit: 2619

Page 14

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Vu, Huy D. can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

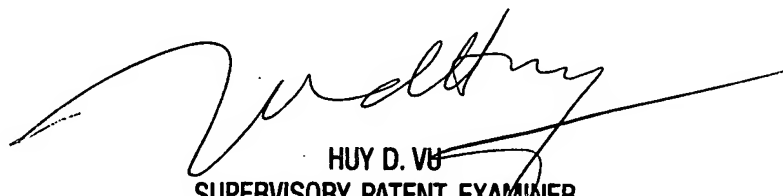
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028. If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Ketan Soni

ks

Nov 29, 2007.


HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600